

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-13. (Cancelled)

14. (Currently Amended) A quantum well structure for the absorption or emission of photons comprising a quantum well layer (7; 107; 207; 301) arranged stacked between two barrier layers (9, 11; 109, 112; 209, 212; 303), wherein at least one of the barrier layers (9, 11; 109, 112; 209, 212; 303) comprises nanostructures (10; 110; 210; 310) arranged such that said nanostructures which cancel or modulate a lateral homogeneity of said quantum well layer extending in at least one lateral direction in the absence of said nanostructures, without substantially influencing energy values in said quantum well layers, of the barrier layer (9; 109; 209; 303D), which is present without the nanostructures (10; 110; 210; 310), characterised in that wherein the quantum well layer (7; 107; 207; 301) is in the form of an absorption or emission layer for the absorption or emission of the photons, and wherein said at least one lateral direction extends perpendicularly to the stacking direction of said layers.

15. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that the quantum well layer (7; 107; 207; 301) comprises an energy band with energy levels of differing energy, wherein the energy values of the energy

levels are so adjusted that the absorption or emission of photons occurs with a given wavelength.

16. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that self-organised three-dimensional structures (10; 110; 210; 310) are present as nanostructures.

17. (Previously Presented) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional structures (10; 110; 210; 310) are made from a material which has a greater lattice constant than the material of the barrier layer (9; 109; 209; 303D).

18. (Previously Presented) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional nanostructures (10; 110; 210; 310) are in the form of quantum dots.

19. (Previously Presented) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional nanostructures (10; 110; 210; 310) are in the form of quantum wires.

20. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that at least one of the barrier layers is in the form of an aluminum

arsenide layer (9; 109; 303D) which includes indium arsenide islands (10; 110; 310) as nanostructures.

21. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that at least one of the barrier layers is in the form of an indium phosphide layer (209) which includes indium arsenide islands (210) as nanostructures.

22. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that it comprises at least two quantum well layers (7; 107; 207; 301) which are each separated from each other at least by a respective barrier layer (9, 11; 109, 112; 209, 212; 303).

23. (Previously Presented) A quantum well structure as set forth in claim 14 characterised in that the nanostructures (10; 110; 210; 310) are of a dimension of less than 50 nm in at least one lateral direction in which they extend.

24. (Previously Presented) A quantum well structure as set forth in claim 23 characterised in that the dimension is in the range of between 5 and 15 nm.

25. (Previously Presented) A quantum well photodetector comprising at least one quantum well structure as set forth in claim 14.

26. (Previously Presented) A quantum cascade laser comprising at least one quantum well structure as set forth in claim 14.